# **Dillon Creek Fire Management Unit**

The Dillon Creek FMU is 46,856 acres. The majority of this FMU is part of the Dillon LSR. All NFS land in this FMU is within the proclaimed Klamath National Forest boundary. This FMU is split between Six Rivers and Klamath National Forest DPA. There is very little private property within this FMU. The Threat Zone identified in the table below is part of a larger WUI zone in an adjacent FMU.

Fire Protection Responsibility	Acres	Percent of FMU
Klamath National Forest	22,911	49%
	23,945	51%
Wildland Urban Interface	Acres	Percent of FMU
Wildland Urban Interface Community At Risk	Acres -	Percent of FMU
	Acres -	Percent of FMU -

## 3.2.2 Guidance

Listed below is the LMP Management Area specific guidance for this FMU.

Management Area	KNF Acres	Percent of FMU	SRF Acres	Percent of FMU
Wilderness	5,073	11%	2,960	6%
LSR	9,158	20%	6,298	13%
RNA/SIA/CUA	-	-	2,831	6%
Riparian Reserves	2,494	5%	3,703	8%
Recreational River	-	-	779	2%
Retention	978	2%	10	<1%
Partial Retention	657	1%	1,105	2%
General Forest	2,109	5%	6,136	13%
No Data	49	<1%	2	<1%
Private (may include BLM)	2,392	5%	120	<1%

### Research Natural Area

The Rock Creek Butte RNA is located in the portion of the FMU administered by the Six Rivers National Forest. In 2008 this RNA was burned during the Siskiyou Complex.

# **Description**

Research Natural Areas are examples of important vegetative, aquatic, and geologic ecosystems of scientific interest and importance, and serve as a baseline for comparing ecological changes. Conditions have developed with little or no influence from human activities. They are managed to preserve naturally functioning plant and animal communities. A network of RNAs has been established nationally.

### **Management Goals**

Manage RNAs for the "maintenance of unmodified conditions and natural ecological processes" (FSM 4063.3).

Preclude impacts from human activities that would modify the value of the RNA. This is to maintain the area's value as a significant contribution to the Forest's biological and physical diversity and also as a gene pool for plant and animal species.

Promote and use RNAs for non-manipulative research and baseline or control sites for Forest management comparisons. Form partnerships with university and research communities.

### **Desired Future Condition**

RNAs exist as examples of healthy ecological communities. Human influences are minimal. Management actions such as prescribed fire may be permitted if they further the management goals of the RNA. Non-manipulative research, monitoring and educational activities are ongoing within RNAs. Knowledge and information gained from RNA studies are incorporated into Forest management.

# **Fire Management Standards and Guides**

MA1-19 Extinguish, as quickly as possible, all human-caused wildfires that endanger the values for which the RNA was established. Use "light hand" fire suppression tactics that cause the least amount of soil disturbance in the area. Allow fires to burn if they are within a prescription designated to accomplish objectives of the specific RNA as prescribed in the RNA implementation schedule.

Implementation schedules should address the sensitivity of each RNA to fire and establish specific guidelines for its use or control. Fire may be used to preserve a vegetative type when thought necessary in the implementation schedule.

MA1-20 Rehabilitate all suppression-related ground disturbance within a RNA using techniques appropriate to overall management goals of the RNA.

#### Wilderness

Part of the Siskiyou Wilderness is located in the western portion of the FMU. This FMU borders the Six Rivers National Forest within the wilderness.

#### **Description**

Wilderness areas are mostly pristine landscapes, managed as vestiges of a wild America. Wilderness resources provide specific values such as solitude, physical and mental challenges, and opportunities for scientific study and primitive recreation.

#### **Management Goals**

Manage for wilderness characteristics, natural conditions, and ecological processes within each wilderness.

Provide recreationists a primitive and semi-primitive, non-motorized recreation opportunity.

Manage for high air quality.

Utilize forage resources consistent with the 1964 Wilderness Act, as amended.

#### **Desired Future Condition**

Each wilderness looks natural, with human disturbances substantially unnoticeable. Ecological processes, including fire, have shaped the vegetative patterns and condition. Some evidence of human influence consistent with the Wilderness Act may be present due to valid mining claims, livestock grazing, and recreational use.

#### **Standards and Guidelines**

MA2-1 To better emphasize wilderness values, manage each wilderness as an integrated resource with inseparable ecosystem parts.

- MA2-2 Minimize the use of motorized equipment and mechanical transport of materials and personnel within wilderness. Carefully analyze the need for motorized equipment and obtain prior documented approval. Schedule such work to avoid disturbance to the public.
- MA2-3 Wilderness values shall predominate if resource conflicts are identified.
- MA2-7 Naturally occurring ecological processes should predominate within wilderness ecosystems.
- MA2-16 Manage smoke from prescribed natural fires (PNF) as a component of the wilderness. Manage prescribed natural fires and prescribed burns (ignited by humans) to reduce future smoke emissions. Coordinate with the proper State and local agencies to meet air quality regulations (see Forest-wide Standards and Guidelines for Air Quality, Fire Management).
- MA2-55 All lightning-started fires will be PNF; unless the fire does not meet the goals and objectives (it then will be declared a wildfire). Permit lightning-caused fires to play their ecological role, as nearly as possible, within the wilderness.
- MA2-56 Each PNF will have a PNF Burn Plan prepared within 48 hours of discovery. Review the Burn Plan daily to assure validity based on current and projected conditions.
- MA2-57 Coordinate fire management actions with forests that share management of the wildernesses.
- MA2-58 A Wilderness Fire Coordinator (WFC) may be established to gather and send out information and aid to the National Forests and Region. The WFC will set priorities for on-going fires within the wilderness areas. The WFC should be at least Nationally qualified as a Prescribed Fire Manager. As a minimum, the WFC should have 1 Fire Information Officer and a Wilderness Resource Advisor.
- MA2-59 Consider all person-caused wildland fires (not management lighted prescribed fires) as wildland fires and use the appropriate suppression response.
- MA2-60 Reduce to an acceptable level the risks and consequences of a wildland fire within or escaping from the wilderness. Assessments of consequences will emphasize potential impacts on residential intermixes, mixed or adjacent landowners, Endangered or Threatened species, etc.
- MA2-61 Permit planned ignitions or management-lighted prescribed fire. This will allow fire to return in a more natural role so managers can select meteorological and fuel situations for future prescribed natural fire. Wilderness fire policy permits the use of management-lighted fires.
- MA2-62 Suppression of wildland fire will use appropriate suppression response and the Minimum Impact Suppression Techniques as outlined in the Forest-wide Fire and Fuels Management Standards and Guidelines.
- MA2-63 Fire prevention will be an important practice within wilderness. Fire prevention activities, such as signing, will concentrate on entrance portals to not diminish the visitor's wilderness experience. Visitor contacts within the wilderness will occur when there is a threat to wilderness preservation or resource protection.

MA2-64 Develop a PNF implementation schedule. For all the resources, develop the decision flow charts and prescription parameters that meet the resource standards and guidelines.

Emergency use of motorized equipment and mechanical transport within the wilderness must be consistent with the delegated authority and approval process outlined by the Forest Supervisor in the letter dated June 2, 2009 (2320/5130). It is also expected that a Wilderness Resource Advisor (WRA) will be assigned to every wilderness fire.

When emergency use of motorized equipment is granted, the authorization must be documented using the Emergeny Wilderness Mechanized Transport/Motorized Equipment Use Authorization form.

BAER is only allowed in wilderness if (1) necessary to prevent an unnatural loss of the wilderness resource or (2) to protect life, property, and other resource values outside of wilderness. Normally use hand tools and equipment to install selected land and channel treatments (FSM 2323.43b)

# **TES Species Habitat**

The TES Species habitat consists of a portion of the Dillon and Bark Shanty LSRs, and four Activity Centers located outside the LSR network. Only the Dillon LSR occurs within lands currently administered by the Klamath National Forest.

#### **Description**

Each of the T&E species requires different habitat. When the habitat of these species overlap, the management priority shall be placed on the species with the most specialized habitat needs (that is, the rarest occurring habitat).

### **Management Goals**

Provide habitat conditions and management activities that contribute to the recovery of Federally listed T&E species and to Sensitive species found on the Forest. Emphasize the recovery of each species, by managing for quality habitat, consistent with ecological processes.

Provide for more than the minimum number of bald eagle and peregrine falcon pairs established by the Recovery Plans and disaggregated to the Forest.

### **Late Successional Reserves**

Late-Successional Reserves are designed to provide for the viability needs of all late-successional species in an ecosystem approach. Meet the habitat requirements as outlined in the Record of Decision (ROD) for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl signed April 13, 1994 and the Final Supplemental Environmental Impact Statement on Management of Habitat for Late Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl dated February 1994 (FSEIS).

## **Description**

LSRs have been designated based on 5 elements: (1) areas mapped as part of an interacting reserve system; (2) Late-successional/Old Growth 1 and 2 areas within Marbled Murrelet Zone 1 and certain owl additions, mapped by the Scientific Panel on Late-Successional Forest Ecosystems (1991); (3) sites occupied by marbled murrelets; (4) known owl activity centers; and (5) Protection Buffers for specific endemic species identified by the Scientific Analysis Team (1993). Additional areas may be included as species are identified as provided for in the survey and management standards and guidelines.

#### **Management Goals**

The objective of LSRs is to protect and enhance conditions of late-successional and "old growth" forest ecosystems, which serve as habitat for late-successional and "old growth"-related species including the northern spotted owl. These reserves are designed to maintain a functional, interacting, late-successional and "old growth" forest ecosystem.

## **Desired Future Condition**

The characteristics of individual areas vary according to the dominant vegetative species, site class, topography and other site factors. Well-dispersed and continuous areas of multi-layered forests with high quality habitat characteristics and attributes are common: (1) under optimum conditions on north slopes, (2) at high elevations, and (3) in cool, moist areas. The overstory trees are large diameter, tall and have obvious signs of decadence. Some are broken-topped, have mistletoe, or have platforms of branches capable of holding organic materials that serve as a nest. Snags are common and fallen trees visible on the ground, providing for adequate prey populations. Within true fir habitats or where hardwoods occur, mid-seral stage forested areas provide suitable habitat as well. Although overstory trees are smaller and stands are less dense, important structural elements, such as snags and nesting platforms, are present. South slopes and drier areas are more open due to frequent natural fires.

### **Exceptions**

RNAs and activities required by recovery plans for listed T&E species take precedence over LSR standards and guidelines.

## **Management Assessment for Late-Successional Reserves**

Management assessments have been completed for LSRs and 100-acre LSRs throughout the Forest. These LSR assessments include: (1) a history and inventory of overall vegetative conditions within the reserve, (2) a list of identified late-successional associated species known to exist within the LSR and information on their locations, (3) a history and description of current land uses within the reserve, (4) a fire management plan, (5) criteria for developing appropriate treatments, (6) identification of specific areas that could be treated under those criteria, (7) a proposed implementation schedule tiered to higher order (for example, larger scale) plans, and (8) proposed monitoring and evaluation components to help evaluate if future activities are carried out as intended and achieve desired results. The Regional Ecosystem Office (REO) has reviewed these LSR assessments. Activities that have been reviewed by the REO have been prioritized for each LSR. LSRs have also been prioritized by activity needs. Refer to the Forest-wide LSR assessment, Taylor, Dillon, Crapo/Little North Fork, and Goosenest LSR assessments. Also, refer to Appendix K, LSR Fire Management Plan, located at the end of this document.

### **Standards and Guidelines**

- MA5-35 Each LSR will be included in fire management planning as part of watershed analysis. Fire suppression in LSRs will utilize minimum impact suppression methods in accordance with guidelines for reducing risks of large-scale disturbances. Plans for wildfire suppression will emphasize maintaining late-successional habitat. During actual fire suppression activities, fire managers will consult with resource specialists (for example, botanists, fisheries and wildlife biologists, hydrologists) familiar with the area, these standards and guidelines and their objectives, to assure that habitat damage is minimized. Until a fire management plan is completed for LSRs, suppress wildfire to avoid loss of habitat in order to maintain future management options.
- MA5-36 In LSRs, a specific fire management plan will be prepared prior to any habitat manipulation activities. This plan, prepared during watershed analysis or as an element of province-level

planning or a LSR assessment, should specify how hazard reduction and other prescribed fire applications will meet the objectives of the LSR. Until the plan is approved, proposed activities will be subject to review by REO. REO may develop additional guidelines that would exempt some activities from review. In all LSRs, watershed analysis will provide information to determine the amount of CWD to be retained when applying prescribed fire.

- MA5-37 In LSRs, the goal of wildfire suppression is to limit the size of all fires. When watershed analysis, province-level planning, or a LSR assessment is completed, some natural fires may be allowed to burn under prescribed conditions. Rapidly extinguishing smoldering CWD and duff should be considered to preserve these ecosystem elements.
- MA5-38 Utilize an aggressive prescribed fire program to maintain long-term habitat quality and ecological processes within LSRs once LSR assessments and National Environmental Protection Act (NEPA) analysis are completed and site-specific decisions are made. Specific fire prescriptions shall be used until PNF can be effectively used. The use of PNF is outlined in the Wilderness Fire Management S&Gs. Those S&Gs also shall apply to LSRs.
- MA5-39 Report wildfires within activity centers to the appropriate District and/or Forest biologist. The biologist shall determine the need to contact the USFWS. Report fires that escape initial attack to the USFWS. Motorized and heavy equipment may be permitted by the Incident Commander to assure habitat protection.
- MA5-40 Wildfire prevention should be critical to habitat maintenance. During critical fire danger periods, increased prevention efforts should be undertaken, especially in high use recreation areas within LSRs and in areas adjacent to populated areas.

# **Special Interest Areas**

There is one SIA in this FMU. The Elk Hole SIA has been established for botanical values and is located within the Siskiyou Wilderness in the portion of the FMU currently administered by the Six Rivers National Forest.

#### Description

Special Interest Areas (SIAs) are sites designated for recreational experiences where education and interpretation of unique or special natural resource values are emphasized. Highlighted are botanical and geologic features to increase Forest visitor appreciation of resource values and natural diversity within the Forest.

## **Management Goals**

Manage for ecological processes and the unique features for which the area was designated.

Promote public use, education, interpretation and enjoyment of the special interest values of the area when such activities do not harm the values for which the area was designated.

#### **Desired Future Condition**

The vegetative, geologic and other natural features are enhanced to emphasize the unique resource for which the area was designated. Few signs of management activities are present, other than to provide public access and accommodations. Minor vegetative clearing is evident to allow

#### **Standards and Guidelines**

MA7-20 Manage prescribed natural fire, prescribed fire, and biomass utilization to maintain the ecological processes within the SIA. Protect all facilities and developments.

# **Cultural Management Areas**

The Dillon FMU contains a portion of the Helkau Cultural Area. This Cultural Area is in the portion of the FMU administered by Six Rivers National Forest. There is the potential for fire management activities to conflict with cultural ceremonies. Check with local district personnel regarding timing of ceremonial activities.

### Description

This management area includes the Helkau and Inam areas on the Happy Camp Ranger District and the Cottimien area on the Ukonom Ranger District. These areas have significant historic, as well as contemporary, spiritual values for the Karuk Tribe of California. These areas are to be managed to maintain special Native American ceremonial values.

For a complete listing of Cultural Areas, refer to Table 4-20, Areas Allocated to Cultural Areas in the Forest Plan (page 4-123).

### **Management Goals**

Provide protection of the ceremonial values that exist in these areas.

Manage to preserve and protect the solitude and privacy of Native American users.

### **Desired Future Condition**

The area is generally forested and influenced primarily by ecological processes. Signs of management activities are not readily apparent. The integrity of the area for use by the Karuk Tribe of California is maintained in a manner consistent with their custom and culture.

### **Standards and Guidelines**

- MA8-1 All coordination will be facilitated through the Tribal Government Program.
- MA8-3 Coordinate planned Forest management activities for areas immediately next to cultural areas with the Tribe. Determine if the activities would affect ceremonies occurring within the cultural area. Mitigation measures should be used to avoid conflicts with ceremonial activities.
- MA8-13 If a fire escapes initial attack, a tribal representative should be requested to work with the Forest Service during the fire containment efforts.
- MA8-14 Use PNF, prescribed fire and biomass utilization to reduce fuels buildups or for the management of vegetation, such as beargrass. Coordinate prescribed fire activities with the Karuk Tribe of California.

## **Retention VQO**

### **Description**

These areas are scattered throughout the Forest. They typically are found: (1) in the foreground of high visual sensitivity roads, trails, etc., (2) in the foreground or middle ground of areas with Variety Class A scenery or (3) areas seen from local communities (USDA Agriculture Handbook #462, National Forest Landscape Management, Vol. 2, Chapter 1). These roads and trails typically receive high levels of public use, or access recreation sites or areas with visually pleasing scenery.

#### **Management Goals**

Provide a level of attractive, forested scenery by maintaining the areas in a natural or natural-appearing condition. Manage human activities so they are subordinate to the characteristic landscape. Also, manage human activities so they are not evident to the casual Forest visitor.

Manage for a programmed, sustained harvest of wood products in areas that are capable, available, and suitable for timber management.

Maintain stand health, as well as resilience to wildland fire, insect, disease, and other damage.

## **Desired Future Condition**

The signs of management activities are not apparent. Views from visually important roads and trails appear forested and provide a natural or natural-appearing forest.

Vegetative or ground-disturbing management activities that have been implemented repeat form, line, color, and texture that represent characteristics of the landscape. Changes in their qualities of size, amount, intensity, direction, pattern, etc. are not evident to the average Forest visitor.

## **Standards and Guidelines**

- MA11-14 Use prescribed fire to reduce natural fuel buildups, to treat post-harvest fuels and to influence vegetative development or composition when there is no market for the slash or down wood.
- MA11-15 Design fuelbreaks to mimic the natural characteristics of the area. On steep ground, design units that are operationally feasible and effective to treat fuels.

### **Recreational Rivers**

The Outstandingly Remarkable Values in Dillon Creek include the cultural values, fisheries, geology, water, scenery, and vegetation.

### **Description**

This prescription applies to those Recreational River segments of either designated components of the National WSRs System or rivers being recommended for possible inclusion in the National System.

The Recreational classification applies to those rivers or sections of rivers that: (1) are free-flowing, (2) are readily accessible by road or railroad, (3) may have some development along the shorelines and (4) may have undergone some impoundment or diversion in the past.

For a complete listing, in the Forest Plan, refer to Table 4-25, Acres Allocated to Designated and Recommended Recreational Rivers (page 4-155).

#### **Management Goals**

Preserve the Recreational Rivers in a free-flowing condition. Protect the rivers and their immediate environments for the benefit and enjoyment of present and future generations.

Protect and enhance the outstandingly remarkable value(s) for which the river(s) are or would be designated, while providing for public recreation and resource uses that do not adversely impact or degrade those values.

### **Desired Future Condition**

The waterway remains generally natural and riverine in appearance. The physical and biological integrity of the aquatic system is maintained. Habitat for anadromous and resident fish species is in good condition, capable of supporting viable populations of indigenous species. The river area may be developed for the full range of agricultural and forestry practices show evidence of past and ongoing timber harvest or include some residential, commercial, or similar development.

## **Standards and Guidelines**

MA13-17 Fire management strategies should normally follow those of the surrounding area. Recognize and incorporate the Recreational river values into the fire suppression tactics. Prescribed fire may be used within the management area to maintain the ecological functions, if it maintains the outstandingly remarkable values for which the river was designated.

## **Partial Retention VQO**

### **Description**

This prescription applies to those areas identified with a Partial Retention VQO. It encompasses 188,500 acres. These areas typically are either in the foreground of moderate visual sensitivity roads, trails, etc., or the middleground of high sensitivity roads.

Scattered throughout the Forest, these areas are primarily in the middle distances (1/2 to 3 miles) from selected roads and trails.

### **Management Goal**

Provide an attractive, forested landscape where management activities remain visually subordinate to the character of the landscape. Manage human activities so they are subordinate to the character of the landscape.

Maintain stand health as well as resilience to wildland fire, insect, disease, and other damage.

### **Desired Future Condition**

Areas managed to meet a Partial Retention VQO may show evidence of management activities but are visually subordinate to the characteristic landscape in form, line, color, or texture of landscape elements. Views from visually important roads and trails appear forested and provide a nearly natural looking landscape.

Lands capable of growing coniferous vegetation are forested.

#### **Standards and Guidelines**

- MA15-15 Use prescribed fire to reduce natural fuel buildups, to treat post harvest fuels and to influence vegetative development or composition when there is no market for the slash or down wood.
- MA15-16 Design fuelbreaks to mimic the natural characteristics of the area. On steep ground, design units that are operationally feasible and effective to treat fuels.

## **General Forest**

### Description

Scattered throughout the Forest, these areas make up about 11% (262,000 acres) of the Forest land base. They are lands that are capable, available, and suitable to be managed for a host of resource conditions, including structural component and commercial outputs. They currently support a variety of vegetation including shrubs, hardwood species, and various tree species in varying sizes and densities. They are areas where timber outputs, consistent with Forest-wide management goals, are of a high priority.

# **Management Goals**

Provide a programmed, non-declining flow of timber products, sustainable through time. These levels may vary from year to year, based on ecological processes. Maintain conifer stocking levels and high

growth rates commensurate with the capability of the site to produce wood fiber. Intensively manage young regenerated stands to maximize growth potential.

Maintain stand health, as well as resilience to wildland fire, insect, disease, and other damage. Emphasize salvage and restoration from catastrophic events. Reforest capable, but currently non-stocked, lands.

Emulate ecological processes and stand and landscape patterns where possible. Within harvest units, maintain appropriate structure, composition, and ecological functioning of the area.

Provide for snags and hardwood habitat to help maintain viable populations of wildlife species that require these structural components.

Meet the VQOs. Achieve less modified visual conditions when possible.

Develop a transportation system to transport Forest commodities efficiently to available markets.

Where possible, adjust planting levels to reduce pre-commercial thinning and fuel hazard costs in the future.

## **Desired Future Condition**

The mosaic of healthy forest stands is comprised of a variety of vegetative species. The composition of individual stands varies considerably depending on forest type and seral stage development. Although openings with hardwoods, shrubs, grasses, and forbs are apparent, forest stands consist primarily of conifers. In some areas, the conifer component of the vegetation is sparse (due to vegetative manipulations or natural conditions). All areas maintain some structural components of older stands. Some areas support mature forest stands. The oldest stands are between 80 and 120 years old. Generally, this portion of the forest has younger trees than the surrounding areas. Stand sizes vary with topography and the landscape pattern of surrounding areas.

Regeneration openings have clumps of green trees on at least 15% of the area. Existing seed tree and shelterwood stands retain their residual trees (3 to 12 trees/acre) for structural diversity.

Stocking control maintains healthy, vigorously growing stands.

Reforestation, timber harvesting, and stand tending activities are commonplace. A network of roads provides access throughout these areas.

Habitat for species, which use early and mid-seral stages, is abundant.

## **Standards and Guidelines**

- MA17-15 Use prescribed fire to reduce natural fuel buildups, to treat post harvest fuels and to influence vegetative development or composition when there is no market for the slash or down wood.
- MA17-16 Design fuelbreaks to mimic the natural characteristics of the area. On steep ground, design units that are operationally feasible and effective to treat fuels.

# 3.2.3 FMU Characteristics

Completion of this section is ongoing

# 3.2.3.1 Safety

ROADS: Access roads to this water shed are 15N19 (Bear Peak road), 14N39 (Pony Peak road) and trailheads into the Siskiyou Wilderness.

AVIATION HAZARDS: No unusual hazards

Other hazards: Dillon Creek trail is midslope and sustained significant damage during the 2008 fires. Fires from 1994 and 2008 have produced heavy snag patches.

## **3.2.3.2** Physical

## 3.2.3.3 Biological

ENDANGERED SPECIES: Dillon Creek has endangered Chinook, Coho and steelhead. Other species are in the area.

### 3.2.3.4 Resources

There are no structures in the watershed except Dillon Creek Campground site. 2008 Siskiyou complex site protection developed holding lines for firing adjacent to the campground

Dozer lines from 2008, 2002 and 1994, exist along the Pony peak ridge and along the Siskiyou Crest from Elbow Spring trailhead toward Harrington Mtn.

Karuk ceremonies may reduce river access during fire season.

HISTORIC SITES: Historic Dillon Creek and Kelsey Trail

Pony Peak Seed Orchard

## 3.2.4 FMU Fire Environment

Completion of this section is ongoing

### 3.2.4.1 Fire Behavior

FUEL TYPE: Mixed conifer. Mixed intensity fire scars from 1994-2008 have produced large areas of plantations and large diameter snags.

### 3.2.3.2 Weather

Managing fire for ecosystem health is acceptable in much of the watershed.